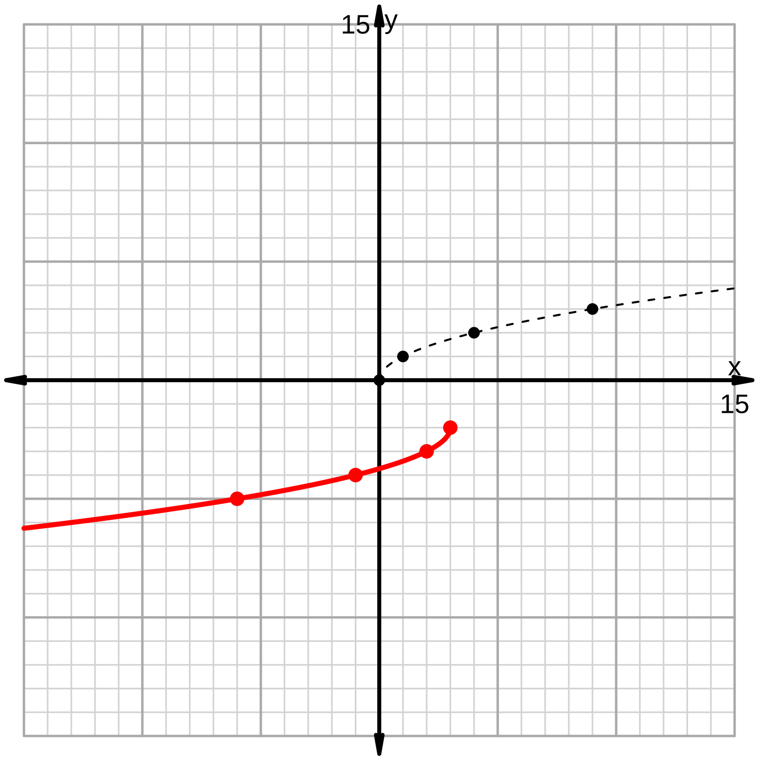
Name: Date:

u10 Radicals, Rationals, and Extraneous Solutions Practice (version 1)

1. Below I've graphed with a dotted curve $y = \sqrt{x}$ with some key points marked with dots. Please draw a graph for $f(x) = -\sqrt{-(x-3)} - 2$, paying close attention to the corresponding key points.



2. State the domain of $y = f(x)$

You can use $x \leq 3$ or $(-\infty, 3]$ to state the domain.

3. State the range of $y = f(x)$

You can use $y \leq -2$ or $(-\infty, -2]$ to state the range.

4. Find all **extraneous** solutions and **actual** solutions to $-\sqrt{-(x-3)} - 2 = x + 1$

$$-\sqrt{-(x-3)} - 2 = x + 1$$

$$-\sqrt{-x+3} = x + 3$$

$$\sqrt{-x+3} = -x - 3$$

$$-x + 3 = x^2 + 6x + 9$$

$$0 = x^2 + 7x + 6$$

$$0 = (x+1)(x+6)$$

So, the possible solutions are $x = -1$ and $x = -6$. Plug each possible solution into the original equation to check.

Check whether $x = -1$ makes equation true.

$$-\sqrt{-((-1)-3)} - 2 \stackrel{?}{=} (-1) + 1$$

$$-4 \neq 0$$

Check whether $x = -6$ makes equation true.

$$-\sqrt{-((-6)-3)} - 2 \stackrel{?}{=} (-6) + 1$$

$$-5 = -5$$

- Actual solution: $x = -6$
- Extraneous solution: $x = -1$

I should say that there is also a graphical approach possible for this problem. If you use it, please explain.

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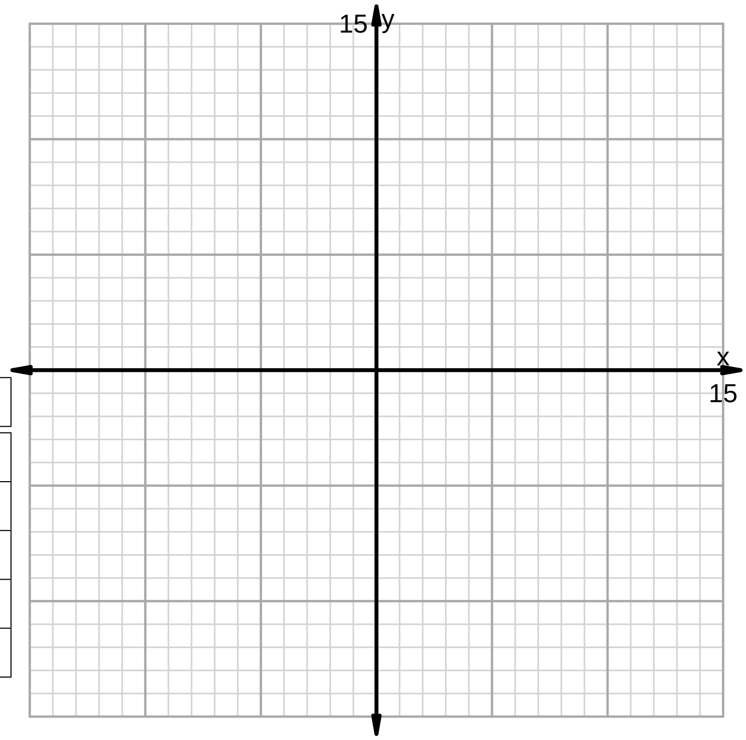
5. Determine the locations of the x-intercept, the removable discontinuity (the hole), and the y-intercept. Based on those features, sketch the rational function.

$$f(x) \;=\; \frac{x^2+6x-16}{x^2-6x+8}$$



feature	x coord	y coord
x-intercept		
y-intercept		
hole		
vertical asymptote		NA
horizontal asymptote	NA	